REMARKS

Claims 1 – 15 are pending in the present application, of which claims 1, 6 and 11 have been amended. No new matter has been added. The objections and rejections set forth in the Office Action are respectfully traversed below.

As To The Merits:

As to the merits of this case, the Examiner relies on the newly cited reference of Ishikawa (U.S. Patent No. 6,316,072) and the reference of record, Ohkura, et al., in setting forth the following rejections:

> claim 1 stands rejected under 35 U.S.C. §102(e) as being anticipated by Ishikawa;
>
> claims 2 - 5 stand rejected under 35 U.S.C. §102(e) as anticipated by or, in the alternative under 35 U.S.C. §103(a) as being obvious over Ishikawa;
>
> claims 6 - 10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ishikawa; and
>
> claims 11 - 15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ishikawa in view of Ohkura, et al.

Each of these rejections are respectfully traversed.

With regard to Ishikawa, the Examiner asserts that:

> Ishikawa teaches a *rotatable optical disk* (10) having a *diffraction granting structure*, (being a plane grating shown in Figures 4 - 6), that is comprised of a *plurality of grooves* formed on the surface of the grating such that the grooves have either blaze structure (Figure 6C) or rectangular structure (Figure 4), wherein it is implicitly true that the *profile* of the groove at radial area is dependent on the *azimuthal* position of the area with respect to the rotational axis, (please see Figures 4 - 6C). This reference has anticipated the claims.[1]

[1]Please see, lines 5 - 10, page 3 of the Action.

However, the field of art to which the invention is applied is so different between the diffraction grating of the present invention and Ishikawa's. The former is for spectroscopy and the latter is for daily use, such as a compact disc with a label printed on it.

Also, the method of use differs greatly. The grating of the present invention is static when it is used as a diffraction grating. It is rotated only when the diffraction wavelength is changed. After the diffraction wavelength is changed, the grating is again static when used as a diffraction grating. On the other hand, Ishikawa's grating keeps rotation while it is used.

Further, the profile of grooves of the diffraction grating of the present invention is formed so that the diffraction efficiency is maximized at every radial area depending on the azimuthal position ϕ. Ishikawa, however, does not teach or refer to the maximization of diffraction efficiency.

In addition, with regard to dependent claims 2, 7 and 12, the Examiner takes the following position, "the claimed equations are simply the standard equations for describing the diffraction phenomenon of a diffraction blaze grating, they therefore can be deducted based on standard knowledge of the diffraction thereby one skilled in the art."[2]

However, such a position is simply unsupported by any of the references relied upon by the Examiner. Moreover, a standard equation for the conventional blaze angle for an area R2 of Fig. 2 is set forth by equation (4) of page 6 of the specification, whereas in contrast the claimed blaze angle of claims 2, 7 and 12, for example, is set larger in the area R2 in order to maximize

[2]Please see, the bridging sentence between pages 3 and 4 of the Action.

the diffraction efficiency of the light diffracted by the area R2 and is given by equation (5) on page 6 of the present specification.

From the above, it is clear that the calculated blazed angle of claims 2, 7 and 12 are not standard equations for describing the diffraction phenomenon of a diffraction blaze grating, as asserted by the Examiner. Moreover, the Examiner has provided no teaching nor support for his position that such claimed equations can be deducted based on standard knowledge of diffraction by one skilled in the art.

Further, it is respectfully submitted that the Examiner fails to relate to the diffraction grating covered with a coating in claims 3 and 5.

In view of the aforementioned amendments and accompanying remarks, the claims, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Version with markings to show changes made

VERSION WITH MARKINGS TO SHOW CHANGES MADE 09/642,883

IN THE CLAIMS:

Claims 1, 6 and 11 have been amended to read as follows:

1. (Thrice Amended) A static plane diffraction grating with grooves formed on a surface thereof, the plane diffraction grating being rotated about a rotational axis which is normal to the surface, and being characterized in that a profile of the grooves at a radial area is determined depending on [a] an azimuthal position ϕ of the area about a rotational center defined as a foot of the rotational axis on the surface of the plane diffraction grating for maximizing a diffraction efficiency of the radial area.

6. (Thrice Amended) An optical system comprising:

a static plane diffraction grating having grooves on a surface of the plane diffraction grating whose profile at an area is determined depending on [a] an azimuthal position ϕ of the area about a rotational center defined as a foot of a rotational axis which is normal to the surface for maximizing a diffraction efficiency at the area;

a mechanism for rotating the plane diffraction grating about the rotational axis;

an incidence optical system for casting a converging beam of light on a point of the surface of the plane diffraction grating, the point being apart from the rotational center.

11. (Thrice Amended) A method of producing a static plane diffraction grating having grooves on a surface thereof whose profile at an area is determined depending on

[a] an azimuthal position ϕ of the area about a rotational center defined as a foot of a rotational axis for maximizing a diffraction efficiency of the area, the method comprising the steps of:

coating a substrate with a photo-resist layer and forming a photo-resist mask from the photo-resist layer according to a preset pattern of groove arrangement;

covering the photo-resist mask with a sector mask having an opening of a narrow sector whose apex is set at the rotational center;

etching the substrate over the sector mask with an appropriate etching condition depending on a rotational position of the sector mask about the rotational center;

rotating the sector mask by an angle of the apex of the narrow sector; and

repeating the etching process and the mask rotating process until the narrow sector sweeps the surface of the substrate.